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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/569,173
Filing Date: February 22, 2006
Appellant(s): JOHNSON ET AL.

Carl A. Giordano
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/15/10 appealing from the Office action mailed 5/21/10.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-13 are pending and stand finally rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

2002/0003520	Aoki	1/10/2002
6,828,950	Koyama	12/7/2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, 9, and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki (US 2002/0003520).

Regarding claim 1, Aoki discloses an active matrix display device (¶ 36) comprising: a display with a plurality of display pixels (fig. 4, ¶ 37);

a data input for receiving a data signal (fig. 6, converter 41, see ¶ 47);

a controller for distributing said data signal over said display pixels to generate an image on said display with an overall brightness value for each display pixel during at least one frame period (fig. 6, controller 50, see ¶ 48),

wherein said device is adapted to divide said frame period for at least one subset of said display pixels (figs. 6 and 8, frame period divided into antecedent and subsequent sub-frames for pixel range Dp, see ¶ 50-51)

such that said display pixels of said at least one subset have at least a light output at a first non-zero brightness level during a first sub-period of said frame period (fig. 9, antecedence sub-frame, see ¶ 54-55) and at a second non-zero brightness level during a second sub-period of said frame period (fig. 9, subsequence sub-frame, see ¶ 55-57).

wherein the first and second levels of brightness and associated sub-periods are selected so that the time averaged sum of said brightness levels of said pixels within said at least one subset is substantially equal to said overall brightness level of said image (fig. 9, see ¶ 58-60),

said second level being maintained a stable level during the second sub period (fig. 9, brightness of subsequence sub-frame constant, see ¶ 55-57)

and the first and second levels being in a known ratio (figs. 8 and 9, see ¶ 55-57, Sc1 is divided by attenuation coefficient F, see also ¶ 50).

Regarding claim 2, Aoki wherein said display is a colour display and said subset is defined by colour (R, G, B) (¶ 40, see also ¶ 47).

Regarding claim 3, Aoki discloses wherein said device is adapted to determine one or more particular areas of said display and said subset is defined by said areas (fig. 6, frame period divided into antecedent and subsequent sub-frames for pixel range Dp, see ¶ 50-51).

Regarding claim 4, Aoki discloses wherein said device is adapted to determine the total time during which said display pixels have had a light output (¶ 74, one frame) and said subset is defined by said total time (¶ 74, attenuation coefficient F based on luminosity signal in one frame).

Regarding claim 5, Aoki discloses wherein said first brightness level exceeds said second brightness level (fig. 9, see ¶ 55-58, Sc1 is divided by attenuation coefficient F).

Regarding claim 7, Aoki discloses wherein said device is adapted to supply a select signal for selecting said display pixels of said subset (fig. 6, see ¶ 48-50, clock signals Sgt and Sdt, and line starting signals Sg and Sd),

said select signal comprising at least a first select signal triggering said first sub-period and a second select signal triggering said second sub-period (figs. 7 and 8, see ¶ 51-53, frame buffer 42 generates two sub-frames and signal switching circuit allocates Sc1 and Sc2 to respective sub-frames, see also ¶ 54 and ¶ 57).

Regarding claim 9, Aoki discloses wherein said display is an active matrix liquid crystal display (¶ 36),

said device comprising a backlight (inherent in liquid crystal displays)

and being adapted to control said backlight such that said light output of said display pixels of said at least one subset yields said first brightness level during said first

sub-period and said second brightness level during said second sub-period (same rationale as claim 1).

Regarding claim 11, Aoki discloses wherein said device is adapted to generate said light output such that said second brightness level has a brightness that is 30% or less than said first brightness level (¶ 55-56).

Regarding claim 12, this claim is rejected under the same rationale as claim 1.

Regarding claim 13, Aoki discloses wherein the first and second sub-periods are adjacent in time (fig. 9, antecedence sub-frame adjacent to subsequence sub-frame).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki in view of Koyama (US 6,828,950).

Regarding claim 6, Aoki fails to disclose wherein said first sub-period has a shorter duration than said second sub-period.

Koyama teaches wherein said first sub-period has a shorter duration than said second sub-period (col. 13, line 7-12, length of display period of the sub-frame periods can be varied).

Both Aoki and Koyama are directed to active matrix displays utilizing sub-frame periods. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the display of Aoki with the driving method and display of Koyama since such a modification provides a display device with high image quality (Koyama, col. 31, line 13-14) in which the number of constant current sources required for gray-scale display can be decreased (Koyama, col. 13, line 24-31).

Regarding claim 8, Aoki discloses that said at least one subset of display elements is driven to at least said first brightness level during said first sub-period and said second brightness level during said second sub-period (same rationale as claim 1).

Aoki fails to disclose wherein said display pixels comprise current emissive elements driven by drive elements and said device is adapted to vary a voltage for said drive elements.

Koyama teaches wherein said display pixels comprise current emissive elements driven by drive elements (fig. 5, EL element 304, see also col. 3, line 1-12)

and said device is adapted to vary a voltage for said drive elements (fig. 2, EL driving voltage).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki.

Regarding claim 10, Aoki discloses wherein said display is a colour display (¶ 36).

Aoki fails to disclose said backlight is a LED-backlight or a colour sequential backlight. LED-backlights and colour sequential backlights are well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the display of Aoki with an LED or a colour sequential backlight since such backlights are well known in the art for providing color displays.

(10) Response to Argument

Appellant argues, specifically with respect to claims 1 and 12, that Aoki fails to provide any teaching regarding the claim elements "wherein the first and second levels of brightness and associated sub-periods are selected so that the time averaged sum of said brightness levels of said pixels within said at least one subset is substantially equal to said overall brightness level of said image." The Examiner respectfully disagrees.

First, Appellant's attention is drawn lines 4-6 of claim 1, specifically the recitation “a controller for distributing said data signal over said display pixels to generate an image on said display with **an overall brightness value for each display pixel** during at least one frame period,” (emphasis added). Lines 12-15 of claim 1 further recite “wherein the first and second levels of brightness and associated sub-periods are selected so that the time averaged sum of said brightness levels of said pixels within

said at least one subset is substantially equal to **said overall brightness level of said image**," (emphasis added). Thus, the first recitation above deals with an image with an overall brightness value for each pixel, while the second recitation is directed to an overall brightness level of the image. In other words, no overall brightness level of said image is claimed, only an overall brightness value for each display pixel.

Furthermore, as is currently claimed, no distinction is made between an ***initial*** overall brightness value for each display pixel (i.e. an overall brightness value generated before said frame period is divided into a first and second sub-period with first and second non-zero brightness levels) and a ***final*** overall brightness value for each display pixel (i.e. an overall brightness value generated by the time averaged sum of the first and second non-zero brightness levels in the first and second sub-periods). In other words, as is currently claimed, "an overall brightness value for each display pixel" (see claim 1, line 5) can represent either an initial brightness value before the frame period is divided, or a final brightness value after the frame period is divided. Thus, the Examiner is interpreting "an overall brightness value for each display pixel" (see claim 1, line 5) as the brightness value achieved after the frame period is divided into a first and second sub-period with first and second non-zero brightness levels.

As stated in the above rejection of claims 1 and 12, Aoki discloses "a controller for distributing said data signal over said display pixels to generate an image on said display with an overall brightness value for each display pixel during at least one frame period" (fig. 6, controller 50, see ¶ 48, luminosity signals Sc1 and Sc2 represent "an overall brightness value for each display pixel during at least one frame period", referred

to as a final brightness value above, see also fig. 8). Aoki also discloses “wherein the first and second levels of brightness and associated sub-periods are selected so that the time averaged sum of said brightness levels of said pixels within said at least one subset is substantially equal to said overall brightness level of said image” (fig. 9, see ¶ 58-60, see also fig. 8 and ¶ 54-57, first and second levels of brightness are Sc1 and Sc2, respectively). In other words, as is currently interpreted by the Examiner, the time averaged sum of the first and second non-zero brightness levels is **necessarily equal** to the overall brightness value **precisely because that is how the overall brightness value is defined**.

Additionally, Appellant’s attention is drawn to the use of the term “known ratio" in claims 1 and 12. It is unclear what is meant by this limitation, specifically it is unclear in what capacity the ratio is to be "known", and thus this term renders the claim indefinite. Should further prosecution of the instant application be necessary, these claims may be rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/KEITH CRAWLEY/

Examiner, Art Unit 2629

Conferees:

/Bipin Shalwala/

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